F_1 score

Problem

In some classification experiment the confusion matrix ***CM*** was obtained, where ***CM***[***c***,***t***] is the number of objects of class ***c*** that were classified as class ***t***.
For each class compute *Precision*, *Recall* and *F_1-score*. Also compute weighted average *Precision*, *Recall, macro F_1-score* and *micro F_1-score* for all classes, where weight is a class distribution.

Examples

CM =

0	1
1	3

class	*Precision*	*Recall*	*F_1-score*
1	0.0	0.0	0.0
2	0.75	0.75	0.75

The classes are distributed as 1:4

- weighted average *Precision* = 0.6
- weighted average *Recall* = 0.6
- weighted *macro F_1-score* = 0.6
- weighted average *micro F_1-score* = 0.6

CM =

3	1	1
3	1	1
1	3	1

class	*Precision*	*Recall*	*F_1-score*
1	0.6	0.429	0.5
2	0.2	0.2	0.2
3	0.2	0.333	0.25

The classes are equally distributed.

- weighted average *Precision* = 0.333
- weighted average *Recall* = 0.321
- weighted *macro F_1-score* = 0.327
- weighted average *micro F_1-score* = 0.317